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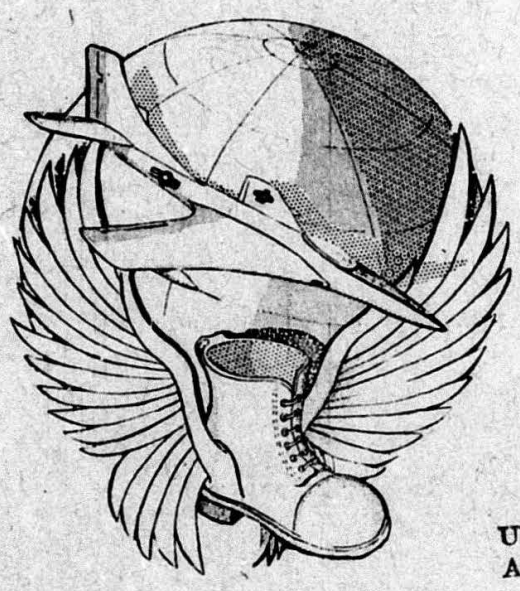
PERSONNEL AND TRAINING PROBLEMS IN SURVIVAL EQUIPMENT



Laboratory Note CRL-LN-55-213

By E. Paul Torrance

June 1955

SURVIVAL RESEARCH FIELD UNIT
Crew Research Laboratory (AFP&TRC)(ARDC)
attached to the
USAF SURVIVAL TRAINING SCHOOL
Stead Air Force Base, Reno, Nevada

PERSONNEL AND TRAINING PROBLEMS IN SURVIVAL EQUIPMENT

This laboratory note was originally prepared as part of an Air Research and Development Command survey of problems relevant to Air Force survival and/or personal equipment.

It should be of interest to agencies concerned with survival equipment requirements, research and development testing, and training in the use of equipment.

It brings together from a variety of sources, primarily unpublished documents, opinions and information concerning the major, recurrent personnel and training problems relevant to Air Force survival equipment, and suggests approaches which might lead to solutions of some of these problems.

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THE SURVIVAL RESEARCH FIELD UNIT is a part of the Crew Research Laboratory, Air Force Personnel and Training Research Center, Air Research and Development Command. It is attached to the 3635th Combat Crew Training Group (Survival), which conducts the USAF Survival Training School at Stead Air Force Base, Reno, Nevada.

The Unit's mission is to conduct research and development in support of Air Force survival training. Major areas of study include:

Problems involved in learning proper survival behavior
Personnel assessment in survival and survival training
Psychological aspects of survival.

Most of the Unit's research and testing are conducted at the USAF Survival Training School, in cooperation with its staff and instructors. The average student attending this school is a combat aircrewman from a USAF tactical command, but classes also include personnel from other commands and other services.

[redacted]

PERSONNEL AND TRAINING PROBLEMS RELEVANT TO SURVIVAL EQUIPMENT*

E. Paul Torrance

The purposes of this Laboratory Note are:

(a) To identify major, recurrent, personnel and training problem-areas relevant to Air Force survival equipment, and

(b) To suggest approaches which might lead to the solution of these recurrent problems.

Special attention will be given to the underlying problems pertaining to issue, maintenance, personal care, and indoctrination in the use of equipment items.

The only study conducted by this Unit dealing specifically with survival equipment items is one concerned with the psychological and training factors affecting the acceptability of Ration, Special Survival, RS-1 (Task 57177, Project 7713). Other sources which have been drawn upon in preparing these comments include the following:

a. Studies of the FEAF Evasion and Escape reports and interviews with aircrewmen downed during World War II or Korean combat (5, 7).

b. Interviews and observations made during a field visit to five Air Force installations in FEAF during combat (11,13).

c. Studies of Air Defense Command accident investigation reports (6,12).

d. A study of the survival training needs of Strategic Air Command fighter pilots (10).

e. Interviews with F-86 pilots experienced in Korean combat (14).

f. A case study of a class of personal equipment technician-trainees caught in a blizzard (15).

g. Conclusions of the Equipment Training Panel of the Second USAF E and E Intelligence Symposium, 30 November -3December 1954 (4) and of a special study made by the Arctic, Desert, Tropic Information Center (1).

Problem areas will be identified and described and suggestions will be made for approaches toward the solution of each.

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* This paper is an informal note and is subject to modification or withdrawal at any time. If referenced, it should be described as an "unpublished draft."

The "It-Can't-Happen-to-Me" Attitude

Interviews with survivors (7) and with F-86 pilots (14), accident investigation reports (12), and observations of combat units (13) all indicate that the "it-can't-happen-to-me" attitude may be responsible for much of the poorly fitted and maintained survival equipment, as well as the lack of understanding and indoctrination on the part of aircrews concerning survival equipment. In many accounts, it is apparent that this attitude is responsible for much of the panic and shock which results in inability to use emergency equipment and accounts for failures to have available essential items of survival equipment when emergencies occur. It is, of course, difficult to motivate men to prepare for a day which may never come.

At the USAF Survival Training School, an attempt is made to replace the "it-can't-happen-to-me" fallacy with the concept that "it won't happen to me, but I'll be prepared -- just in case." This latter concept, however, is met with some resistance, particularly by some high ranking officers who have been brought up in the "it-can't-happen-to-me" tradition. Such officers, of course, oppose all survival training and believe that it breeds anxiety and weakens feelings of invulnerability. Scattered evidence, however, suggests that the "it-won't-happen-to-me-concept, but- I'll-be-prepared-just-in-case" philosophy actually frees aircrewmen of the anxiety which results from the "it-can't-happen-to-me" concept and makes them more willing to take the calculated risks necessary to win in combat. It is also believed that aircrewmen who have accepted this philosophy and all that it means are less likely to have accidents and more likely to respond adequately in emergencies.

The above inferences can be supported by a large number of incidents occurring both in combat and in the ZI, but one example will serve to illustrate the basic principle. A B-29 navigator related that while in combat, he was always concerned about how he would act in an in-flight emergency. He listened to survival lectures and had thought out what he would do in various kinds of emergencies. He was still quite envious of his co-pilot, a "happy-go-lucky fellow who never gave it a thought." When an emergency occurred, the navigator was quite calm and able to do just the right thing at the right time. The "happy-go-lucky" co-pilot panicked badly, endangering the lives of the whole crew. The entire crew was quite shocked, because they had thought that the co-pilot would be the "last man in the world" to panic. This phenomenon is not rare and should not be a mystery. The navigator had the proper "set" and the co-pilot did not. The problem is discussed in some detail in "Psychological Aspects of Survival: A Study of Survival Behavior" (7, pp. 61-67).

Even though certain aspects of this problem seem quite clear, the problem needs to be understood much more thoroughly. We need to know the extent to which the "it-can't-happen-to-me" concept is held by aircrewmen and the effect it has on their retention of survival equipment training and on their practices in regard to the care and use of survival equipment. There is a need for developing and testing the effectiveness of training techniques and organizational practices for modifying this concept.

The Evadee-Survivor's Load

The most commonly voiced complaint of F-86 and F-84 pilots is that survival equipment is too bulky and/or heavy. Some pilots seek to solve this problem by carrying only the bare necessities. Others either carry none at all or carry so much that they endanger their safety. The following are quotations from interviews with combat experienced F-86 pilots (14):

> "The biggest difficulty was in finding adequate personal equipment which was not too faulty, which I could still fly with. A fighter interceptor pilot has to be able to look around. If he isn't, he will get shot down. Each man should make up his own kit and make his own decisions ...Some of the pilots who were shot down were shot down because they were carrying so much equipment with them that they couldn't look around and the MIG's got up on them before they knew it."

> "I did not use the survival gear at all because of its weight and hindrance to free movement. If you did not have it on, you would not have needed it in the first place, because you would not have been shot down ...Bulky survival gear decreases maneuverability."

> "I would have been willing to sit on a block of wood and leave the parachute and all the personal equipment behind because I would have been cutting down on the chances of getting hit. All the equipment that these people wear over there doubles their chances of their getting shot down because they cannot maneuver in the cockpit as they should..."

In some respects, the Air Force's problem concerning personal equipment is similar to the Army's problem as described in Marshall's "The Soldier's Load and the Mobility of the Nation" (2). It is understood that much current effort is being exerted by equipment development specialists to develop lighter personal equipment items and survival kits. The Arctic, Desert, Tropic Information Center study (1, p.5) concluded that the "Korean war experience indicates that survival equipment must be integrated into a man's clothing and personal equipment, not be carried outside of the clothing in separate packs and containers, nor carried in the pockets of flying clothing."

Although the implementation of the above two approaches will no doubt improve the situation, they are not likely to result in a completely satisfactory solution. One procedure observed in a B-26 squadron in Korea offers some promise. The personal equipment officer had eliminated a number of items which would not be needed in the type of survival situations to which the crews of the squadron might be exposed. Some consideration has also been given to the concept of selecting survival equipment for each mission on the basis of knowledge concerning the terrain over which the mission will be flown. Choosing items in accord with one's individual plan of evasion and escape has also received attention. For example, one ace reported that he carried a "Blackjack" instead of a knife, because he planned to use it to knock out a crew chief in his plan to steal a MIG and fly it back to one of our bases.

There is a need for developing sound principles for implementing the approaches outlined above. The successful functioning of the approaches mentioned in the above paragraph is dependent upon thorough training which will result in an understanding of the function of survival equipment items, skill in their use, and a knowledge of the requirements for survival under conditions to which the aircrewman is likely to be exposed. There may also be a need to study the inhibiting effects of personal equipment on freedom of movement. Some of this effect may be as much psychological as physical and might be modifiable through training. This would appear to be a researchable problem.

Reaction to Stress and the Need for Overlearning

FEAF Escape and Evasion Reports and Accident Investigation Reports support the conclusion that inadequate recognition has been given the fact that some individuals suffer a decrement of performance in emergencies and must rely upon overlearning which results only from practice and refresher training. Pilots of jet aircraft have faltered because they had not mastered the sequence in operating their ejection equipment. In their excitement, crewmen downed behind enemy lines in Korea could not operate their URC-4 radios. One pilot was afraid to pop his flare because he had never popped one and was afraid it would go off in his face. There is no place for "trial-and-error" learning in an emergency.

It seems evident that there are some items of equipment which require only demonstration or information for their successful use. Others require at least one rehearsal. Still others require extended practice until operation becomes automatic. When a new item is developed, a study should be made as to what training and/or how much practice is required for successful operation of the item. The Equipment Training Panel of the Second USAF E&E Intelligence Symposium recommended that "all survival, evasion and escape equipment be given final tests in the environment and under conditions which realistically simulate those in which they will be used" (4, pp 6-2). It might be further recommended that as many of these tests as possible be carried out in the simulated survival, escape, and evasion situation of the USAF Survival Training School and that tests also be conducted concerning the nature and extent of the training necessary for adequate utilization of the item.

The need for overlearning is stressed in USAF Survival Training and in publications prepared for aircrew personnel in both SAC (5) and ATC (6), but little evaluation has been made of the effectiveness of these media in terms of changed attitudes and practices.

The "Safety and Management" Concept

Concern has been expressed that poorly fitted and maintained personal equipment, as well as a lack of understanding and indoctrination on the part of aircrews, may be a contributing factor to many unexplained accidents. Relevant to this concern is the concept of "flying safety as a function of management" being promoted by the Air Defense Command (12). A number of interesting and potentially fruitful personnel and training

research problems are suggested by this concept. Two of the major ones will be outlined below.

The Problem of Getting the "Truth"

The ADC safety and management concept (12) maintains that if accident investigations are adequate, each such investigation will demonstrate that safety is a function of management. The obvious difficulty, however, is in getting the complete facts -- the "full truth." Failure to "get the truth" about accidents and near accidents has even more obvious implications, of course. One pilot described to me a personal experience in which he was flying a new type of aircraft. On one of his early training missions, he failed to perform a certain operation. After successfully completing a very risky landing, he recognized his mistake and corrected it before getting out of the aircraft in order to conceal his error and risk reprimand or elimination. Following this, several accidents including fatalities, occurred apparently for this same reason. The aircraft was soon modified to correct the defect responsible for this error but corrective action might have resulted much earlier, if the "truth had come out" in the first near-accident.

A solution to this problem might be approached through research concerning the inhibiting influences toward "getting the full truth" through accident investigations. One clue concerning the breaking-down of these inhibitions might be taken from a procedure used in one fighter interceptor squadron in Korean combat (14). A type of critique and a squadron "atmosphere" was developed in which everyone freely discussed his errors. Apparently the willingness of the squadron commander and the aces in the squadron to discuss their errors was responsible for this freedom of discussion. In other words, they were successful in removing the threat from revealing the "truth". Another clue might be taken from the technique developed by S. L. A. Marshall in compiling military history (3). His is an informal, non-legalistic, group interview in which all participants seek to establish exactly what happened. Also relevant is General Sir Ian Hamilton's concept that: "On the day of battle, truth stalks naked. Thereafter they put on their little dress uniforms." (3, vi).

Predominant Attitudes in Units

Scattered evidence indicates that in some units, predominant attitudes are distinctly unfavorable to good practices concerning survival equipment. This was very obvious in one combat organization visited in FEAF (13). The man who carried survival equipment on missions was openly ridiculed by those who saw him with it. One navigator who followed good personal equipment practices reported the following incident. He was assigned to fill in for the navigator of another crew on a particular mission. As usual, he carried his survival equipment. The members of the crew gave him a peculiar look. Finally one of the gunners asked, "What's the matter with you, Lieutenant? Are you yellow?"

Ridicule is always a powerful psychological force and is especially potent in more or less permanent groups such as combat crews, combat squadrons, etc. Needless to say, an attitude such as that described above is dangerous because of the psychological set which it develops.

From the standpoint of personnel and training research, there is a need for information about how detrimental attitudes concerning survival equipment are developed and maintained in certain units, how these attitudes can be modified, how sound unit attitudes can be developed, and what type of training can help to "immunize" a crewman against the influences of unfavorable attitudes.

Psychological and Training Factors Affecting Acceptability of Survival Equipment

It appears quite likely that psychological and training factors are responsible for the poor acceptance of certain items of personal and/or survival equipment. The determination of these factors should result either in modifications of the item or in training procedures designed to modify attitudes toward the item. In some cases, it is easier to modify the item; in others, it is necessary to modify the psychological factors. In either case, an understanding of psychological and training factors affecting acceptability is necessary.

A good example is afforded by our study of the psychological and training factors affecting the acceptability of Ration, Special Survival, RS-1, especially the meat food product bar commonly known as pemmican. The Aeromedical Laboratory conducted acceptability tests of the ration in connection with the field exercise of Advanced Survival Training in the spring and summer of 1954. While collecting data for this study, it became obvious to this writer that there were important psychological and training factors affecting the acceptability of the ration. The addition of chili and onion powder, one of the features of this ration, improved its acceptability. Some individuals still reacted to it in an extremely unfavorable manner. These facts plus a recognition of the importance of food prejudices in survival in general motivated the initiation of a series of studies designed to determine what psychological and training factors were affecting the acceptability of this ration.

It was found that prior expectations or sets about the ration existed and were exerting a tremendous effect on reactions to the ration. Especially strong is the effect of the perceived attitude within one's crew and the predominant attitude at one's home base. Personality studies revealed certain characteristics of those reacting unfavorably. This information provides interesting clues for training techniques designed to modify reactions to the ration. For example, individuals reacting unfavorably characteristically refuse to oppose the opinions and will of others. This suggests two approaches: (a) creating the perception of a predominantly favorable attitude toward pemmican in the group, or at least guarding against the development of an anti-pemmican atmosphere and (b) encouraging a definitely experimental attitude and dependence upon one's own judgments. Certain training factors were also found to

be affecting acceptability. For example, individuals who reported that they were fatigued at the time of initial use tended to react more unfavorably than those whose initial use occurred when they were not fatigued. It is known that fatigue depresses appetite and no new food is likely to taste very good when one is fatigued. The obvious implication is to encourage trainees to rest a little before eating pemmican. Follow-up experiments demonstrated that the communication of information from this study could be used to modify the acceptability of the ration. An operations applications report on this study will be prepared at an early date.

It is believed that the study sketched above serves as an example of the kind of role which personnel and training research can play in research and development of survival equipment.

Particularly interesting would be a study of reactions to the use of weapons as a part of one's personal equipment. In spite of regulations requiring the carrying of weapons, it was repeatedly reported to this writer during his visit to a B-29 wing that almost no one carried a weapon on combat missions. It is possible that lack of skill in the use of the weapon is at least partly responsible for this state of affairs. If so, this is an important training factor in itself. It is likely, however, that there are important psychological factors operating and that this is a researchable problem.

Communication and Close Working Relationships

The lack of communication between the various agencies interested in personal and/or survival equipment is too obvious and well-known to require documentation. For example, the following conclusions were reported by the Equipment Training Panel of the Second USAF E & E Intelligence Symposium (4):

> "Agencies concerned with equipment requirements, research and development, testing, and training in the use of equipment, do not have sufficiently close working relationships."
>
> "Major air commands are not adequately informed about the status of equipment development and standardization."

These conclusions represent no new insights. Why then, in spite of the recognition of this deficiency, does the lack of communication still prevail? What are the forces which serve as barriers to communication?

It is likely that this is a researchable personnel problem. For example, it has been suggested by some experts in the field that the condition results from "petty jealousies" among the agencies involved and is likely to continue as long as the management of research and development of survival equipment is such as to encourage these jealousies. They say that each agency perceives other agencies as threats and behaves in a competitive manner and withholds rather than communicates information. If this is true, things are perceived as a matter of individual survival, not dissimilar to the situation which existed

in many POW camps and in such tragedies as that of the famous Donner Party. If this supposition is true, it could be revealed by an adequate study of the management of research in this area and such a study should yield clues for the modification of the situation so that agencies would be freer to communicate and work more closely with one another without threats to their survival.

Development of Training and Utilization Procedures

It is the opinion of the writer that the research and development on an item of equipment should not be considered complete until procedures have been developed and tested for training in its utilization. An example of this deficiency occurred when the URC-4 radio was introduced into certain combat units in Korea. It was not until several crewmen had gone down and been unable to make use of their URC-4's that Fifth Air Force prepared a simple poster instructing personnel how to operate this item.

The writer also believes that more attention should be given to the development of principles of equipment utilization which can be emphasized in survival training. This is necessary for the most complete utilization of available items of equipment. All of the possible uses of each item can never be anticipated. For example, two members of the B-47 crew which bailed out over Canada in the winter of 1955 made rather novel uses of their dinghies. One inflated his and used it to stand on as his base of operations. Its insultaing properties gave him additional protection against exposure to cold. Another used his as a poncho to give him added protection against the elements. Now, a dinghy is provided for a specific purpose and training is directed to this end. What good is a dinghy in survival in snow-covered Canada? If survival is seen as a matter of obtaining food, sleep, protection against the elements, etc., the answer becomes more obvious.

Another principle is that of availability, suggested by Allen in his analysis of survival equipment (1). He concluded that the primary problem of survival equipment is its availability rather than its efficiency. He maintains that men lost their lives or were captured because the item they needed to effect survival was not in reach when they needed it. This is a principle which requires implementation both in research and development and in training.

Need for Trained Personal Equipment Technicians and Officers

The writer does not know to what extent the lack of trained personal equipment technicians and officers is still a deficiency. During combat in FEAF such a deficiency existed and was recognized at all levels, including Headquarters FEAF and Headquarters 5th Air Force (11, 13). Pressure was being exerted on unit commanders to fill their TO positions for personal equipment and survival officers, but the lack of trained personnel was a definite obstacle. In June 1953, Fifth Air Force Operations and Training had a plan for a mobile training unit to provide on-the-job training for personal equipment technicians. Since that time,

a large number of men have been graduated from the personal equipment technician's course at Chanute Air Force Base and this deficiency may no longer exist. There is probably still a problem of upgrading these technicians and providing additional on-the-job training. This problem has been discussed with personnel at Headquarters Air Defense Command (12), but it is not known what action has been taken by any of the Commands.

During one period, personal equipment technicians received a part of their training under the auspices of the 3635th Combat Crew Training Group. Instructional personnel of this organization on several occasions complained of the poor quality of personnel assigned to this training. A limited amount of testing of some of the more promising of these men with the screening devices used in the selection of survival instructors supports this conclusion. Our own rather intensive study of one class of these trainees caught in a blizzard (15) indicated that these men did not themselves have a proper appreciation of their equipment and did not take proper care of it under adverse conditions. Thus, there may also be a need for better methods of screening airmen for training as personal equipment technicians.

SUMMARY AND CONCLUSIONS

An effort has been made to identify from a variety of sources the personnel and training problems relevant to Air Force survival equipment. The following major problem areas were identified and discussed:

(a) The prevalance of the "it-can't-happen-to-me" attitude and the barrier which it erects to the acceptance of items of survival equipment, the proper fitting and maintenance of equipment, and the understanding of its use.

(b) The evadee-survivor's load and consequent tendencies either to carry no survival equipment or to carry so much equipment as to constitute a flying hazard.

(c) Reactions to stress and the consequent need for overlearning through practice and refresher training concerning the use of emergency equipment.

(d) The "safety and management" concept with the accompanying problems of getting the "truth" through accident investigations and of modifying predominantly unfavorable attitudes in units.

(e) Psychological and training factors affecting the acceptability of survival equipment items.

(f) Inadequate communication between the various agencies concerned with equipment requirements, research and development, testing, and training in the use of equipment.

(g) The need for developing training and utilization procedures for each item of equipment.

(h) The need for a sound program of on-the-job training and upgrading of personnel equipment technicians and possibly for better selection procedures.

The following proposals were suggested as approaches to the solution of the above problems:

(a) Personnel and training research which will result in information about the extent to which the "it-can't-happen-to-me" concept prevails among aircrewmen, the effect it has on the retention of survival equipment training and on equipment practices, and the effectiveness of various training techniques and organizational practices in modifying this concept.

(b) Research to develop sound principles for choosing survival equipment items to meet the requirements of survival situations to which the crewman is exposed and to yield information concerning physical and psychological effects of personal equipment in inhibiting movement.

(c) The testing of new equipment items in the simulated survival, escape and evasion exercise of Advanced Survival Training to determine the nature and extent of the training necessary for adequate utilization of the item.

(d) Research to determine what barriers exist against "getting the full truth" through accident investigations and to develop procedures for breaking down these barriers.

(e) Personnel and training research to yield an understanding of how detrimental attitudes concerning survival equipment are developed in a unit, how sound unit attitudes can be fostered, and what type of training can help to "immunize" crewmen against influences of unfavorable attitudes.

(f) Research which will result in an understanding of the psychological and training factors affecting acceptability by aircrewmen of new equipment items and "problem" types of equipment.

(g) Personnel research concerning the management of research and development of survival equipment which will provide an understanding of the barriers to communication and close working relationships among the various agencies concerned with equipment requirements, research and development, testing, and training in the use of equipment and will develop procedures for breaking down these barriers.

(h) The development of training and utilization procedures, particularly for new items of equipment.

(i) The need for working with major commands in developing adequate programs of on-the-job training and upgrading of personal equipment technicians.

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